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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/516,431

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Robin John Batterham

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EXAMINER

MCGUTHRY BANKS, TIMA MICHELE

ART UNIT

PAPER NUMBER

1793

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/516,431	<b>Applicant(s)</b> BATTERHAM ET AL.	
	<b>Examiner</b> TIMA M. MCGUTHRY-BANKS	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4,9-17,19,20,22,23 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,9-17,19,20,22,23 and 25-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Claims***

Claims 1, 6, 9, 10, 2, 23 and 25-27 are as previously amended, Claims 2-4, 11, 16, 17, and 19 are as previously presented, Claims 5, 7, 8, 18, 21, and 24 are cancelled, Claims 13-15 are as originally filed and Claim 28 is new.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 6, 9-12, 16, 20, 22, 23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 92/018249.

WO '249 discloses a process for recovering gold from sulfide bearing ores (p. 1 lines 4-22) where the ore is crushed and screened (p. 2 lines 20-24) and exposed to pulses of microwave energy (p. 2 lines 3-8). WO '249 discloses that X-ray diffraction (XRD) revealed there was no significant difference between crushed ore samples before and after microwave energy processing (p. 9 lines 18-23) and teaches controlling energy to prevent fusing or oxidation (pp. 9-11), which in the absence of further structural limitations, examiner contends is the same as “without significantly altering the mineralogy” (claim 1), “without catastrophic destruction of the ore particles” (claim 2) and without “catastrophic break down of the particles” (claim 20). WO '249 discloses that XRD indicated that conductive constituents were all affected to a minor degree by microwave processing (p. 9 lines 23-30), and that the microwave energy causes

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“mechanical breakdown” (p. 3 lines 21-25) therefore structural alteration of the ore particles occurred as in instant claims 1, 20, 21 and 27. Regarding the limitation of differences in thermal expansion resulting in regions of high stress/strain, WO '249 teaches that pulsed microwave energy results in, inter alia, differential thermal expansion. All factors induce stress and cracks that result ultimately in structural distortion and breakdown of the crushed ore (page 10, lines 20-26). Regarding the duration of pulses, WO '249 teaches pulses of 1 to 30 seconds duration (abstract); a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See MPEP § 2144.05 I. Regarding the dimension of the particles, 95% of the ore passes through a 2 mm screen (abstract). In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. See MPEP § 2144.05. With respect to claims 6 and 22, WO '249 discloses exposing the ore to 1300 W of pulsed microwave energy (p. 10 line 27 – p. 1 line 1), which is pulse of high energy as in claims 5, 6 and 22. With respect to the pulse period time in Claims 9, 10, 25, and 26, a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation; therefore a *prima facie* case of obviousness exists. See MPEP § 2144.05 II B. With respect to claims 11 and 27, WO '249 discloses recovering gold from ore (abstract). With respect to claim 12, WO '249 discloses treatment of gold in sulfide ore (p. 1 lines 7-21 and p. 9 line 31 – p. 10 line 26). With respect to claim 16, WO '249 discloses treatment of ore containing pyrite (p. 5 lines 1-5 and p. 9 lines 8-15).

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Regarding Claim 23, WO '249 meets the limitation of pulses at high energy, since the pulses are between 650 W and 1300 W (page 14, lines 16 and 17).

Claims 4 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO '249 as applied to Claims 1 and 12, and further in view of Haque (1999).

WO '249 discloses the invention substantially as claimed. However, WO '249 does not disclose screening to remove fines from the ore particles as in Claim 4 or disclose copper (claim 13), nickel (claim 14) or uranium (claim 15).

With respect to claim 4, Haque (1999) reports a review of microwave-assisted mineral treatment tests (abstract), and reports that particle size is an important factor in heating ores, and that depending on the type of ore smaller particles will either heat faster or slower than larger, e.g. for magnetite coarser particles heat faster (paragraph bridging pp. 11 and 12). Particle size is therefore recognized in the art as a result effective variable and would have been optimized in the process of WO '249 as a matter of routine investigation by one of ordinary skill in the art at the time the invention was made, since Hague (1999) teaches that size affects heating rates (see M.P.E.P. § 2144.05, II, B).

With respect to claims 13-15, Haque (1999) discloses results of studies of sulfidic ores including chalcopyrite (table 6, p.9) and pitchblende containing uranium (Table 5, p. 8) which indicate that both heat readily from microwave exposure, therefore one of ordinary skill in the art would be motivated to treat chalcopyrite or pitchblende ores containing uranium in the process of WO '249 since Haque (1999) teaches that both ores are readily heated by microwaves, and heating is desired in WO '249. Further, since Haque (1999) teaches that most sulfide ores tested heated well (p. 11, 1<sup>st</sup> paragraph) one of ordinary skill in the art would have reasonable

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expectation of success in treating nickel sulfide ore in the process of WO '249 since the ability to heat of the ore by microwave energy is desired.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO '249 as applied to Claim 1 above, and further in view of GB 2 198 242.

WO '249 discloses the invention substantially as claimed. However, WO '249 does not disclose use of the process with diamond bearing ore.

GB '242 discloses a method of sorting ore particles, including kimberlite (i.e. diamond bearing) based on attenuation of microwave radiation (abstract). GB '242 teaches that kimberlite ore is strongly attenuating (i.e. absorbs energy) (p. 6); therefore one of ordinary skill in the art would have reasonable expectation of success in treating diamond bearing ore such as kimberlite in the process of WO '249, since the absorption of energy by the ore (i.e. heating) is desired.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO '249 as applied to Claim 1 above, and further in view of Connell et al (US 3,261,959) or Haque (1999).

WO '249 discloses the invention substantially as claimed. However, WO '249 does not disclose microwave treatment on a conveyor.

Connell et al discloses a microwave treatment system for ores while traveling on an enclosed conveyor belt which applies uniform application of microwave energy to the ores on the belt (col. 3 lines 28-64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the conveyor system of Connell et al to process ores in WO '249 since Connell et al discloses uniform treatment of ores in this system.

Haque (1999) discloses that microwave heating is performed either in batch or continuous, and that continuous systems are equipped with conveyor type belts to move the

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material through the oven for heating (pp. 4 and 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the conveyor belt system of Haque (1999) in the process of WO '249 to provide a continuous process as taught by Haque (1999).

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO '249 in view of Haque.

WO '249 discloses a process for recovering gold from sulfide bearing ores (p. 1 lines 4-22) where the ore is crushed and screened (p. 2 lines 20-24) and exposed to pulses of microwave energy (p. 2 lines 3-8). WO '249 discloses that X-ray diffraction (XRD) revealed there was no significant difference between crushed ore samples before and after microwave energy processing (p. 9 lines 18-23) and teaches controlling energy to prevent fusing or oxidation (pp. 9-11), which in the absence of further structural limitations, examiner contends is the same as “without significantly altering the mineralogy” (claim 1), “without catastrophic destruction of the ore particles (claim 2) and without “catastrophic break down of the particles” (claim 20). WO '249 discloses that XRD indicated that conductive constituents were all affected to a minor degree by microwave processing (p. 9 lines 23-30), and that the microwave energy causes “mechanical breakdown” (p. 3 lines 21-25) therefore structural alteration of the ore particles occurred as in instant claims 1, 20, 21 and 27. Regarding the limitation of differences in thermal expansion resulting in regions of high stress/strain, WO '249 teaches that pulsed microwave energy results in, inter alia, differential thermal expansion. All factors induce stress and cracks that result ultimately in structural distortion and breakdown of the crushed ore (page 10, lines 20-26). Regarding the duration of pulses, WO '249 teaches pulses of 1 to 30 seconds duration

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(abstract); a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See MPEP § 2144.05 I. Regarding the dimension of the particles, 95% of the ore passes through a 2 mm screen (abstract). In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. See MPEP § 2144.05. WO '249 discloses exposing the ore to 1300 W of pulsed microwave energy (p. 10 line 27 – p. 1 line 1), which is pulse of high energy. However, WO '249 does not disclose screening to remove fines from the ore particles.

Haque (1999) reports a review of microwave-assisted mineral treatment tests (abstract), and reports that particle size is an important factor in heating ores, and that depending on the type of ore smaller particles will either heat faster or slower than larger, e.g. for magnetite coarser particles heat faster (paragraph bridging pp. 11 and 12). Particle size is therefore recognized in the art as a result effective variable and would have been optimized in the process of WO '249 as a matter of routine investigation by one of ordinary skill in the art at the time the invention was made, since Hague (1999) teaches that size affects heating rates (see M.P.E.P. § 2144.05, II, B).

### ***Response to Amendment***

The declaration under 37 CFR 1.132 filed 30 June 2008 is insufficient to overcome the rejection of claims 1-4, 9-17, 19, 20, 22, 23 and 25-27 based upon WO '249 as set forth in the last Office action. Regarding paragraphs 8 and 12, the examiner withdraws the rejection based on overlapping ranges, but maintains that the ranges are close enough. A *prima facie* case of



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obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See MPEP § 2144.05 I. Regarding paragraph 9, high stress and maximizing expansion are not comparable quantitative results that would be sufficient to overcome the teachings of WO '249. Regarding paragraphs 10 and 11, the claimed particle size of 15 cm or less reads on applicant's description of the fines taught in WO '249. Regarding paragraph 13, sizes larger than those exemplified in WO '249 are not separately claimed. Regarding paragraph 14, the "high" energy defined by applicant is taught by WO '249, since 1.3 kW is within the range of above 1 kW. "Substantially above" is neither defined nor exemplified.

### ***Response to Arguments***

Applicant's arguments filed 30 June 2008 have been fully considered but they are not persuasive. Applicant's arguments are addressed in response to the declaration.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/  
Supervisory Patent Examiner, Art Unit  
1793

/T. M. M./  
Examiner, Art Unit 1793  
25 August 2008